

Research Proposal

2016.11.13

Querying Scatterplots by Sketching

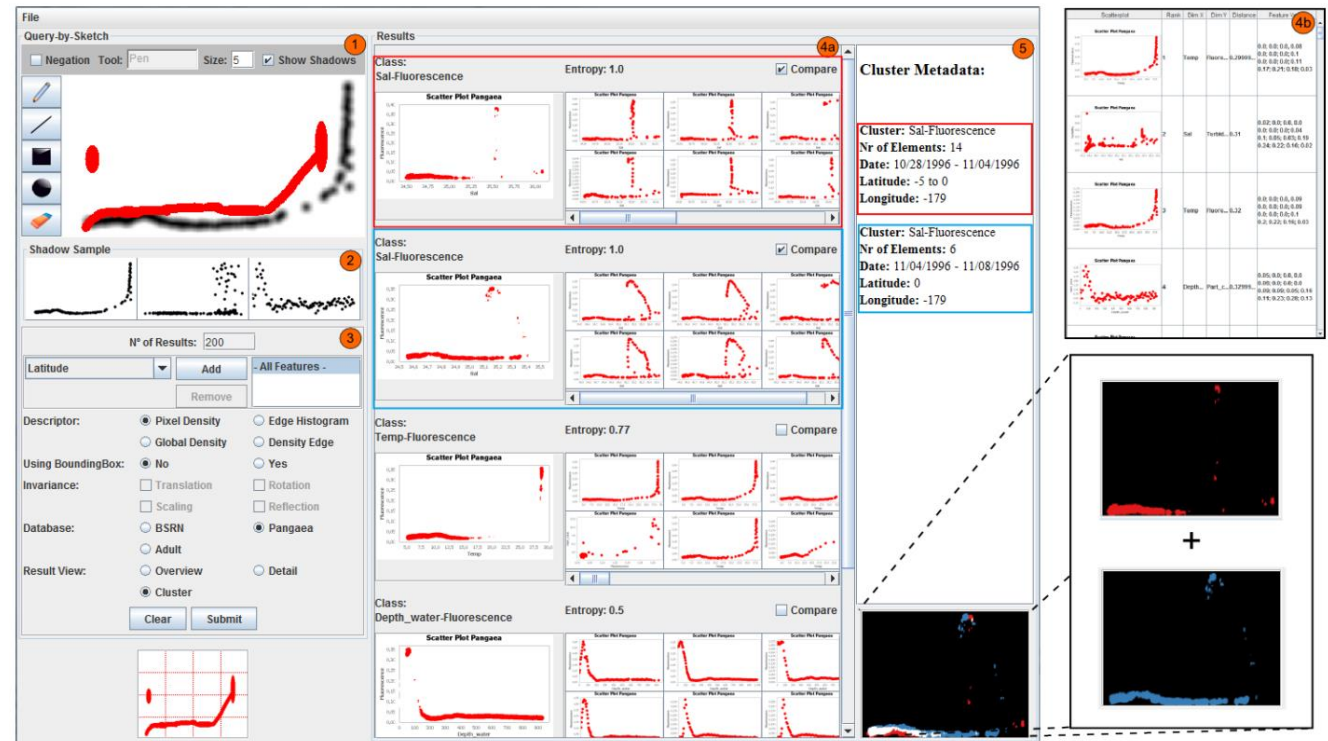
- Background
 - Visualization results -> images
 - Image recognition
- Challenges
 - How to explore large amounts of scatterplots (e.g. scatterplot matrix of a high-dimensional dataset)
 - Conventional strategy: overview + detail (New strategy: query first, explore the query set, detailed querying on demand)

Expected Contributions

- A scheme of **indexing scatterplot images** with **deep learning models** from the perspective of **recognition**
- A **querying strategy** for searching useful views from a massive set of scatterplots

Related Work

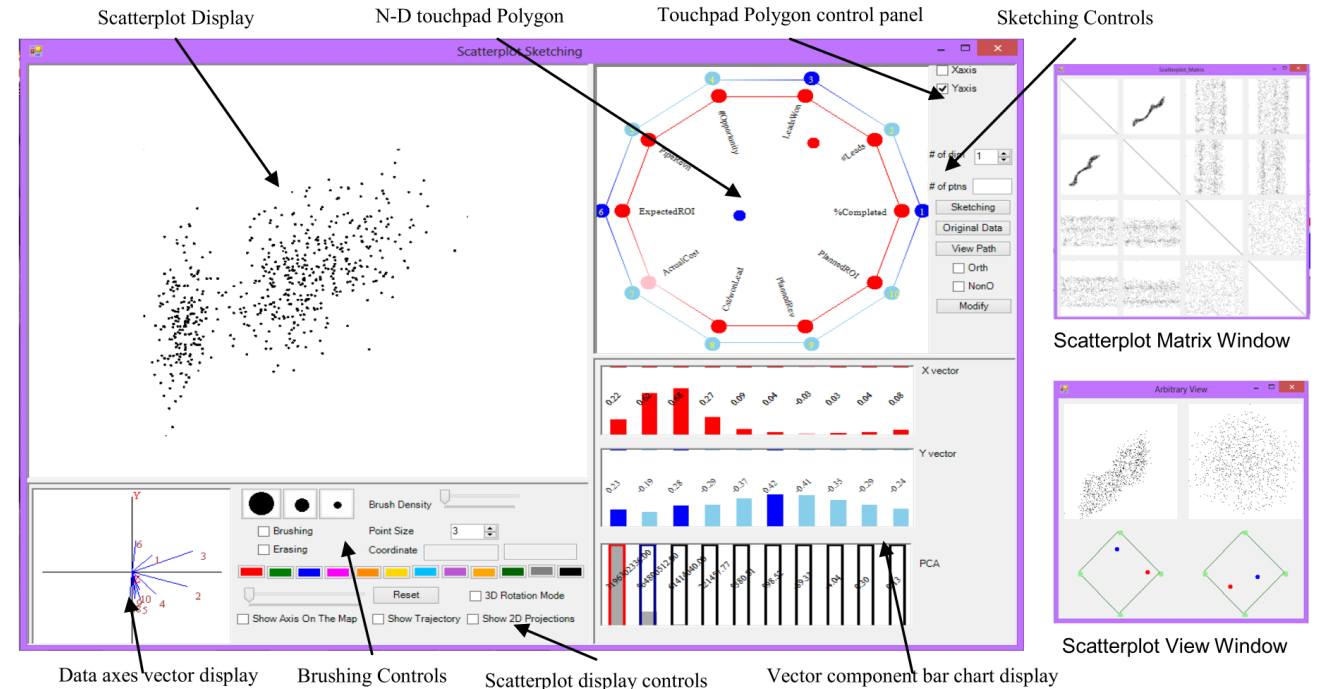
- Search scatterplots by (Euclidean) similarity between two sets of data points
- Cons: Relatively low accuracy



Muthumanickam, P. K., Vrotsou, K., Cooper, M., & Johansson, J. (2014). Guided Sketching for Visual Search and Exploration in Large Scatter Plot Spaces.

Related Work (Cont.)

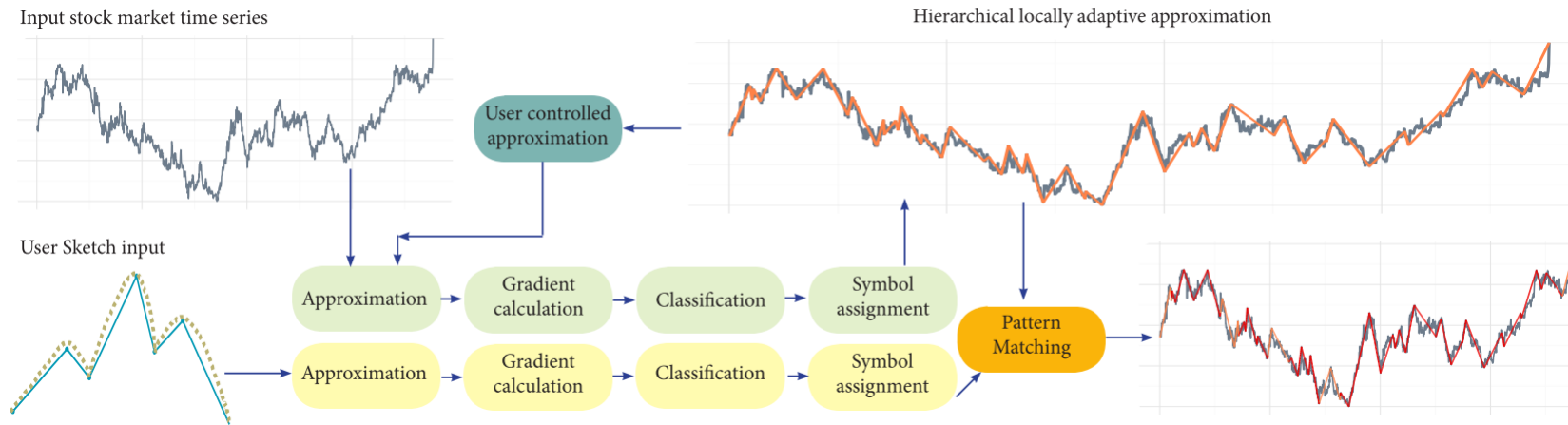
- Generating synthetic high-dimensional dataset by sketching and sculpting



Muthumanickam, P. K., Vrotsou, K., Cooper, M., & Johansson, J. (2013). SketchPad N-D : WYDIWYG Sculpting and Editing in High Dimensional Space. *IEEE Transactions on Visualization and Computer Graphics*, 19(12), 2060–2069.

Related Work (Cont.)

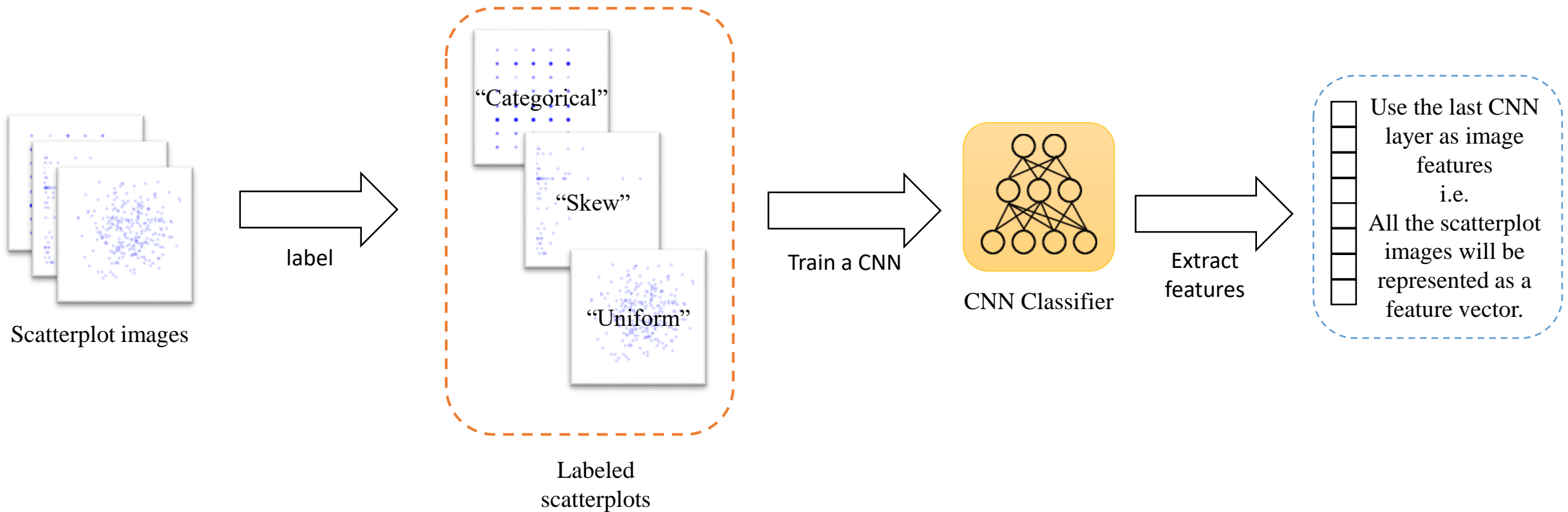
- Sketch and search time series



Muthumanickam, P. K., Vrotsou, K., Cooper, M., & Johansson, J. (n.d.). Shape Grammar Extraction for Efficient Query-by-Sketch Pattern Matching in Long Time Series. VAST 2016.

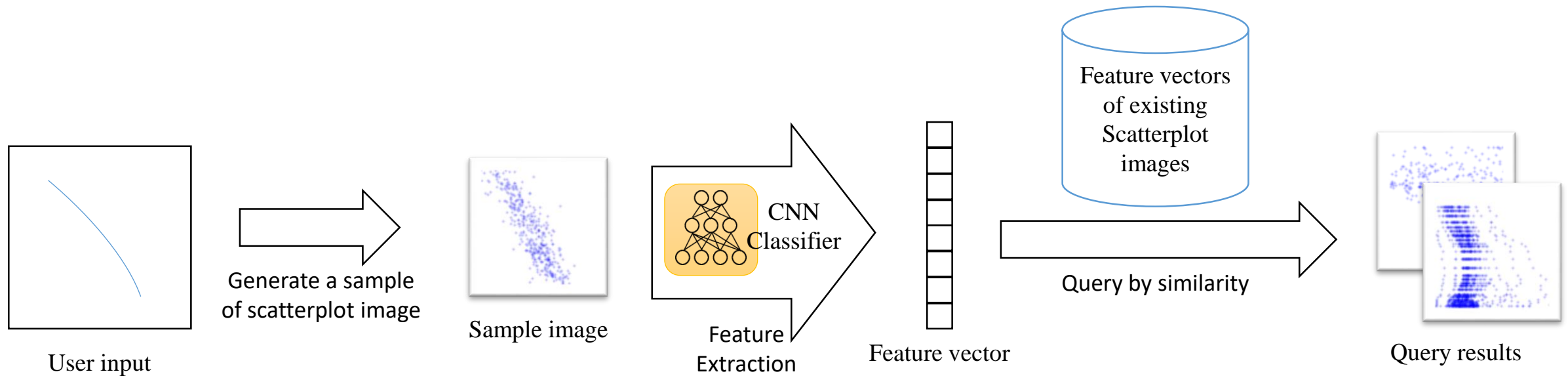
Overview

- Stage 1: Model Training and Feature Extraction



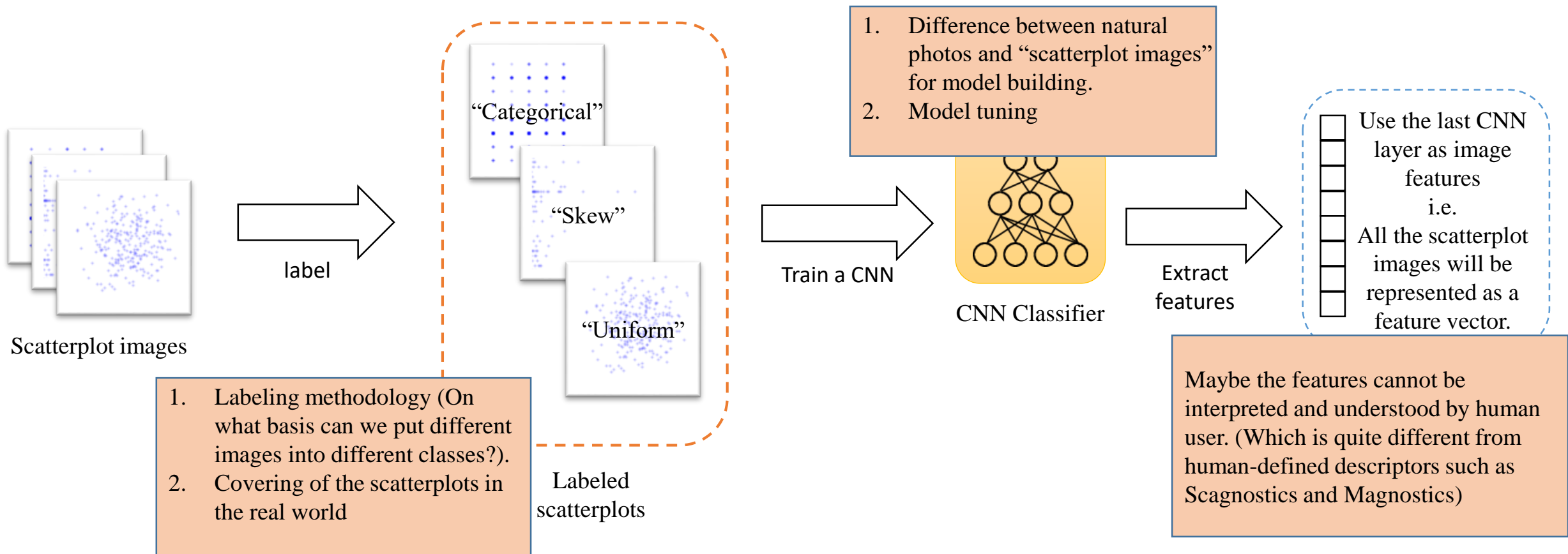
Overview (Cont.)

- Stage 2: Sketch and Query



Problems

- Stage 1: Model Training and Feature Extraction



Problems (Cont.)

- Stage 2: Sketch and Query

